

COLORADO WATER CONSERVATION BOARD  
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Denver 3, Colorado

November 9, 1962

M E M O R A N D U M

TO: L. R. Kuiper, Acting Director.  
FROM: F. L. Boydston, Jr., Sr. Hydraulic Engineer.  
SUBJECT: Analysis of "Substitute Plan for Ruedi Dam".

A "Resume of Substitute Plan for Ruedi Dam Fryingpan River, Colorado" was submitted to this office for investigation by land owners along the Fryingpan River. Two substitute dams were proposed as follows: "-- one at Chapman Creek, to hold 70,000 acre feet, on the Fryingpan, and one at the head of North Fork Canyon to hold 30,000 acre feet -- ". Since these two proposed dams would be only a few miles downstream from the planned collection system of the Fryingpan-Arkansas project, the initial approach to the problem was to see how much storable water would be available at each proposed damsite. Next it was decided to determine the capacity of the reservoirs necessary to store the available flows and the assured annual useable yield with such storage.

Lacking definite information on the location of the two dams proposed as a substitute for Ruedi Reservoir and deeming it necessary to have some answers as soon as possible, sites were selected from best information available. From the Mt. Jackson



quadrangle sheet, the site on the North Fork of Fryingpan appears to be fairly good, but the site on the Fryingpan below Chapman Gulch does not appear to be very desirable. The sites were not inspected personally since we had no exact information that these were the intended locations.

Using the Bureau of Reclamation estimates of the remaining flows at Norrie after diversions to the Fryingpan-Arkansas project, estimates of the monthly storable flows at the two damsites were made after assuming releases for fish flows. Fish flow requirements at Norrie were considered to be the same as for the original studies with the reservoir at Ruedi. The period 1911 through 1957 was used and results were as follows:

Average annual storable at North Fork	5,300 A.F.
Average annual storable on Fryingpan	<u>10,000 A.F.</u>
Total average annual storable	15,300 A.F.

Minimum storable was in 1931 with 1,000 A.F. and maximum storable was in 1957 with 50,500 A.F.

On the basis of the flows available for storage at the two damsites an analysis of the most critical periods indicated that on the North Fork a reservoir with 8,900 A.F. would be required in order to yield 3,800 A.F. annually. The analysis for the Fryingpan site indicated that for the critical period, a reservoir of 16,500 A.F. capacity would be required to obtain a constant annual yield of 7,200 A.F. The critical period from filling to filling for both sites was June, 1929, to June 1938. Total storage at the substitute



reservoir sites would be 25,400 acre feet compared with 100,000 acre feet at the Ruedi reservoir. The combined annual yield of the reservoirs would be 11,000 acre feet. This yield is far below the estimated requirement in year 2014 of 70,000 acre feet - which amount would be available from Ruedi reservoir. The proposed substitute reservoirs would be sufficient to supply replacement water for diversions to the Fryingpan-Arkansas project, but would not have enough for much development of western slope projects or industries.

A reservoir on the North Fork with a capacity of 13,500 A.F. would only increase the annual yield by 300 A.F., and a 30,000 A.F. capacity reservoir on the Fryingpan would only increase the annual yield by 800 A. F. Holdover in both of these larger capacity reservoirs would be required for twenty-four years between fillings to obtain the slightly increased yield. Larger surface areas exposed would increase evaporation so that probably very little additional yield would actually be available for use either for replacement of Fryingpan-Arkansas diversions or for western slope projects.

Without topographic surveys of the reservoir sites, only very rough estimates of the area-capacities could be made, and unless such estimates are necessary at this time, it would seem advisable to await more detailed information from proponents of the substitute plan.